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April 6, 1992

VIA FEDERAL EXPRESS

Mr. Ruben B. McCullers
Environmental Scientist
RCRA Compliance
United States Environmental
Protection Agency, EPA Region VII
726 Minnesota Avenue
Kansas City, Kansas 66101

Re: In the Matter of The Knapheide Manufacturing Co., West Quincy, Missouri, EPA Docket No. VII-92-H-0008

Dear Mr. McCullers:

Please find enclosed for review and approval a Closure Plan submitted on behalf of Knapheide Mfg. Co. ("Knapheide") in accordance with Paragraph 57(b) of the Complaint, Compliance Order and Notice of Opportunity for Hearing (the "Complaint") issued in the above-referenced proceeding. The Closure Plan was prepared by ATEC Associates, Inc. and addresses the waste paint filters and overspray paper storage area and the area surrounding the Brule incinerator, as the Complaint requires.

We are ready to schedule a second settlement conference with you, Mr. Richards, and other appropriate officials at the EPA's convenience. We think it would be helpful to be able to discuss at that time any comments you or the Missouri Department of Natural Resources may have regarding the Closure Plan, and therefore suggest that the meeting be scheduled after such review. We are, however, prepared to meet at an earlier time if you and Mr. Richards deem it appropriate.

Knapheide's compliance with Paragraph 57(b) of the Complaint does not constitute an admission by Knapheide of any of the specific factual allegations or legal conclusions contained in the Complaint. Further, Knapheide reserves the right to assert any and all defenses it may have to said allegations and to dispute the appropriateness of any other element of the Complaint.

Very truly yours,

Sandra L. Oberkfell

Sandra L. Oberkfell

SLO:lml

Enclosures

cc: Mr. Bruce Martin (w/ encl.)
Robert W. Richards, Esq. (w/o encl.)
Mr. Harold Huggins (w/ encl.)
Mr. Steve Townsend (w/o encl.)

CLOSURE PLAN
FOR
WASTE PAINT FILTERS and OVERSPRAY PAPER STORAGE UNIT
and the
BRULE INCINERATOR UNIT

Prepared for:

KNAPHEIDE MANUFACTURING COMPANY
West Quincy, Missouri

Prepared by:

ATEC ENVIRONMENTAL CONSULTANTS
2275 Cassens Drive
Suite 123
Fenton, Missouri

Submitted To:

United States Environmental Protection Agency
Region VII
Kansas City, Kansas

April 7, 1992

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CLOSURE PLAN
FOR
WASTE PAINT FILTERS and OVERSPRAY PAPER STORAGE UNIT
and the
BRULE INCINERATOR UNIT

1.0 INTRODUCTION

Knapheide Mfg. Co. (Knapheide) assembles custom truck body parts at its facility located in West Quincy, Missouri (Figure 1). The West Quincy facility operation includes the painting of assembled products.

Recently the United States Environmental Protection Agency (EPA), Region VII alleged in a Resource Conservation and Recovery Act (RCRA) Compliance Complaint that waste paint filters and overspray paper generated by the painting operation are characteristically hazardous due to leachable chromium toxicity. The facility was cited in that complaint in part, for storage of these hazardous wastes over 90 days without a permit. In a Compliance Order referencing this alleged violation, EPA required that the facility close the alleged waste paint filter and overspray paper storage unit in accordance with interim status rules as approved by the Missouri Department of Natural Resources (MDNR). In addition, EPA required that an inoperative Brule incinerator be similarly closed as a treatment unit of waste paint filters and overspray paper.

The hazardous waste management unit subject to this Closure Plan is referred to by EPA as the "waste paint filters and overspray paper storage unit and the Brule incinerator unit". The units are adjacent to each other and are located at the south edge of the facility (Figure 2). The area being addressed by this plan (hereinafter referred to as the subject closure area), as further defined in Section 4.1 of this plan, is somewhat larger than the specific areal extent of these units to provide coverage of the area associated with ancillary waste handling activities (Figure 3).

The wastestream referred to in the EPA complaint is waste paint filters and overspray paper (hereinafter referred to as used absorbent material) used to collect paint residues. Used absorbent material was handled and stored at the subject closure area in air-tight 55-gallon metal containers. Between 1979 and 1989, the used absorbent material was disposed of in the small on-site Brule incinerator. A more detailed description of waste generation and handling is provided within this Closure Plan (Section 3.1). For the purpose of this Closure Plan, the terms used filters and overspray paper will refer to absorbent material wastestreams containing paint residues generated from all paint booths and handled as described hereto.

In March 1992, the subject closure area was assessed to determine the applicability of RCRA closure by removal (clean closure) regulations. The sampling and analysis plan, field sampling report, and sample analytical results of that activity are contained in Appendices A, B, and C, respectfully. The purpose of this Closure Plan is to respond to EPA's Compliance Order to provide a Closure Plan for the subject closure area.

2.0 DISCUSSION OF CLEAN CLOSURE

Under RCRA interim status rules, a hazardous waste storage facility does not have specific closure requirements for a container storage area or the containment system. A storage facility of hazardous waste under interim status closes the facility in compliance with general interim status closure requirements (40 CFR 265 Subpart G). General closure of interim status storage facilities involves closure in a manner that meets an identified performance standard in an approved Closure Plan, as amended, within the allowable time frame. Disposal of material(s) generated during closure activities will be handled according to applicable requirements. The closure will be certified as having been completed according to the approved Closure Plan by an independent registered professional engineer.

In addition to general interim status closure requirements, interim status closure of a hazardous waste incinerator facility mandates that at closure, hazardous waste and hazardous waste residues (including, but not limited to, ash) must be removed from the incinerator (40 CFR 265 Subpart O).

Closure of a hazardous waste management unit can be accomplished by either closure by removal (clean closure) or by closure in-place. Closure of storage units and incinerator units are conducted as clean closures unless the closure performance standard cannot be achieved by a removal action. Clean closure is achieved when hazardous wastes, waste residues, and impacted surficial material, if present at the time of closure, are removed from the unit to a degree that meets a waste-specific and site-specific performance standard. Waste residues are hazardous constituents that can reasonably be derived from a hazardous waste in quantity, and at concentrations above levels of human health or environmental concern. The performance standard for waste residues is based upon an EPA-recommended health-based limit such that constituents left in the soil, if any, are not at levels above human health or environmental concern. The point of exposure to waste residues, if any, left at closure is assumed to be directly at the storage area boundary. The primary objective of clean closure is to eliminate post closure care and monitoring of the facility by minimizing human health and environmental risks.

EPA approval of clean closure is contingent upon site-specific demonstration by the owner/operator that removal has occurred, such that detectable levels of waste residuals, if any, are below regulated levels and no further action is necessary. Demonstration of clean closure is waste-specific and site-specific. The EPA has provided a method to demonstrate the acceptable levels of waste residues at hazardous waste units through the rule-making process for corrective action at hazardous waste management facilities. The action levels provided within the rule-making process are based upon the latest human toxicity information. Closure documentation must include specific details such as maximum inventory, past site activities, and assessments, sampling events, schedules and identification of a performance standard. Upon completion of a removal action, if necessary, a follow-up sampling and analysis program will assess the unit area to the degree that environmental risks are deemed insignificant and warrant no further monitoring of the site (e.g, post-closure care). The EPA's policy is that post-closure care is unnecessary if no hazardous wastes or waste residues are present in the environment above levels of human health or environmental concern. Therefore, clean closure is achieved when the hazardous wastes and waste residues that were in the hazardous waste unit have been removed to below action levels, as shown by factual circumstances.

2.1 Performance Standard

In order to achieve clean closure, the performance standard for each hazardous waste or waste residue present at the waste management unit must be met at the time of closure. The first performance standard requirement is the removal of all hazardous waste from the management unit. At a container storage unit, all containers of hazardous waste must be removed from the storage area. At incinerator units, incinerator residues must be removed from the unit.

The second performance standard requirement is a health-based limit of a specific constituent, based upon the latest toxicity information compiled by EPA. Two prominent factors utilized in formulating a health-based performance standard are water quality standards (Maximum Contaminant Level [MCL]) and verified reference dose (RfD). The water quality standards can be applied to wastes or subsoils by determining a constituent's leachable concentration and comparing the leachable concentration to water quality standards. Verified reference dose concentrations are modified by exposure assumptions in defining a performance standard. EPA has applied exposure and risk assumptions to latest human-health toxicity information and has presented the calculated allowable action levels in RCRA rule-making documents.

2.2 Verification Sampling and Analytical Program

Verification of clean closure conditions at a waste management unit is waste-specific and site-specific and can be accomplished by a sampling and analysis program. The focus of such a program is to further demonstrate that waste residues, if present at the units at the time of closure, are below the waste-specific and site-specific performance standard. The scope of the program is based upon the physical and chemical characteristics of the hazardous waste or waste residues that could reasonably be derived from the hazardous wastes managed at the units. The verification sampling and analysis program for the subject closure area is detailed as part of this Closure Plan (Section 4.5.2).

3.0 PAST WASTE MANAGEMENT UNIT ACTIVITIES

This section describes the waste management practices conducted within the units, specifically in regard to both the nature of, and potential for, presence of waste residues remaining within the units at the time of closure.

The hazardous waste management units subject to this Closure Plan is referred to by EPA as the "waste paint filters and overspray paper storage unit and the Brule incinerator unit". These units are adjacent to each other, and are located at the south edge of the facility (Figure 3).

The combined wastestream referred to in the EPA Complaint consists of used absorbent material used to filter exhaust air within spray booths, contain drippage, and mask areas which are not to be painted. Paint residue is absorbed onto this material during normal operations. Paint residue comprise a relatively small proportion of the used absorbent material when compared to the total volume of filter and paper used in this process. The absorbent material is composed primarily of paper or other non-hazardous combustibles. Over the course of the operational history of the West Quincy facility, airborne paint residues generated at the facility have been collected using absorbent material.

Between 1979 and September 1989, used absorbent material was burned in a small on-site Brule incinerator that is also subject to the EPA Compliance Order. Used absorbent material containing paint residues is currently being managed as a regulated hazardous waste (EPA Designation No. D001,D007) transported to an off-site fuel blending operation as an alternate or energy recovery fuel.

Activities that were conducted at the subject closure area consisted solely of storage of used absorbent material within air-tight 55-gallon metal containers and incineration of used absorbent material. Storage activities involved moving used absorbent material from satellite storage areas into the subject closure area on pallets. Incineration activities consisted primarily of placing used absorbent material into the small Brule incinerator and subsequently removing incinerator ash and placing it in air-tight 55-gallon metal containers for storage within the subject closure area. Ash generated by incineration activities from 1979 until 1989 was collected and contained

within the subject closure area, and was subsequently removed from the subject closure area in June 1991.

3.1 Wastestream Generation and Waste Handling Practices

The West Quincy facility generates a solid wastestream consisting of paint residues absorbed onto filters and paper material. Airborne paint mist and drippage associated with the painting process is collected onto absorbent material in two distinctive ways. Airborne paint mist is collected by filters mounted in front of wall-mounted exhaust fans. Excess paint that drips off painted parts and is collected on paper floor coverings, and paper used for masking parts, is referred to as overspray paper. Most of the used absorbent material wastestream is composed of filters, not overspray paper. Used absorbent material generated from each paint booth may be characteristically different depending upon the type of paint used at each booth, the specific type of painting process at each booth, and how used absorbent material is handled at each booth.

Used absorbent material is periodically and systematically placed in containers located at various satellite storage areas located throughout the facility. In the past, when full, containers within the satellite storage were placed onto wooden pallets and moved by forklift to the subject closure area for staging prior to incineration (see Figure 3). Subsequently, containers of used absorbent material are handled similarly, but containers are staged in a different area on-site and only held in temporary storage prior to transport off-site for appropriate disposition. The containers utilized to store used absorbent material are of good structural integrity and are compatible with the material contained therein.

3.2 Wastestream Disposal

The facility is currently under contract with Chief Supply (Chief) of Haskell, Oklahoma to transport and dispose of the used absorbent material wastestream off-site. Chief blends the used absorbent material with other combustible fuels and re-distributes it as an energy recovery fuel at an appropriate treatment, storage, disposal facility (TSDF).

As noted above, from 1979 until September 1989, containers of used absorbent material were incinerated on-site within a small Brule incinerator. According to the manufacturer, the Brule incinerator would achieve approximately 95 percent efficiency in reducing the volume of burned material. Based upon an annual generation (prior to 1989), and subsequent incineration of 12,000 waste paint filters (of which approximately 10 percent was comprised of overspray paper), approximately five to 10 55-gallons containers of ash would be generated per year. The incinerator was operated under an air permit provided by MDNR under MDNR Waste Management Program Policy #202.

3.3 Nature of the Hazardous Waste

The actual wastestream which is characteristically hazardous due to chromium, is the paint residue generated from a specific paint product. Within the past year, the facility has identified one specific paint which is responsible for the chromium content. The only paint which contains a sufficient concentration of chromium (2.2 percent by weight as zinc chromate), to become characteristically hazardous is identified as Sikkens Red Primer #S15/84 manufactured by Akzo Coatings of America. Previous tests of residues from this particular paint indicate that hexavalent chromium is a significant component of the total chromium content. Red Primer #S15/84, as well as other paints utilized within the facility, harden due to catalysts added to the paint. In a liquid or semi-solid state, this paint product would be expected to exhibit the characteristics of leachability for chromium. However, as wet paint residues solidify, the characteristics of leachability for chromium would be expected to decrease.

Since this paint product is absorbed onto both filters and paper, the wastestream volume is greatly increased. In addition, other used absorbent material generated from other painting processes on-site which do not contain chromium, are combined with the chromium containing absorbent material and handled as one wastestream. Therefore, the volume generated of the used absorbent material wastestream that is characteristically hazardous due to chromium is relatively small when compared to the total volume generated of used absorbent material.

The exact quantity of chromium containing paint residues within each container of used absorbent material is not precisely known, but total paint residuals are estimated to range from

between five to 10 percent by weight of the used absorbent material wastestream. The estimated quantity of paint residues (excluding the absorbent material) generated at this facility per year is approximately 6,000 pounds (10 percent of total volume or 15 pounds per container at 400 containers per year). Estimating the chromium containing portion of the used absorbent wastestream to be approximately 50 percent of the total paint residue volume, the chromium containing wastestream approaches small quantity generator status (i.e., less than 1,000 kilograms per month).

Good Try I Wrong

Absorbent material does not add to the toxicity characteristics of used absorbent material and is not a component of the hazardous wastestream except when considered under the "mixture rule". However, for the purpose of this Closure Plan, the entire used absorbent material wastestream has been presumed to be a RCRA hazardous wastestream.

3.4 Current Conditions/Potential of Waste Residue Release

The currently inoperative Brule incinerator, constructed on a concrete pad, is located within the subject closure area (Figure 3). The former container storage area is no longer used for the storage of used absorbent material.

The potential for a release of paint residues from air-tight metal containers holding used absorbent material within the subject storage area, in a quantity and concentration that posed a threat to human health and the environment, is highly unlikely to have occurred for several reasons. First, the containers were sealed during storage so that even if a container were upset, spillage of its contents was unlikely. Second, paint residues are bound to the absorbent material, and therefore, in a less mobile physical state so that even if the contents of a container were spilled, paint residues would not be readily released into the environment. Third, the hazardous waste constituent for which paint residue may exhibit characteristics of leachability for chromium, is in a form (hexavalent chromium) that oxidizes quickly to a less toxic state when exposed to ambient conditions. Fourth, due to the small volume of chrome containing paint residue estimated to be present within any container, the likelihood of a significant quantity of chrome to be released into the environment, so as to become a threat to human health or the environment, is extremely small. For these reasons, paint residues at levels of human health or

environmental concern are not expected to be present within the former container storage area today.

When the Brule incinerator was in operation, used absorbent material was periodically placed into the combustion chamber. As with stored materials, the amount of chrome containing paint residue is estimated to be small when compared to the total volume of absorbent material burned in the incinerator (Section 3.3); only a small portion of incinerator residues would be composed of matter associated with paint residue. Incinerator residue consisted of both ash and particulate matter released as smoke. Ash generated from the incinerator during its operation was periodically removed from the incinerator and stored in air-tight metal containers within the subject closure area. During the March 1992 verification sampling event (Section 4.5.3), there was no visual evidence of incinerator residue in the subject closure area. Ash remaining in the incinerator when it was taken out of service was removed and stored with the used absorbent material and subsequently removed from the subject closure area in June 1991. (M-Engels)?

Due to the estimated small volume of paint residue actually incinerated on-site, and given the unstable nature of the hexavalent chromium (the hazardous waste constituent) and the visual absence of ash within the subject closure area, chromium containing paint residues associated with the incinerator operation at levels above human health or environmental concern are not expected to be present within the subject closure area.

3.5 Closure Regulatory Overview

EPA has mandated through the Compliance Order that the storage area be closed under interim status closure standards as implemented under Missouri Hazardous Waste Management Rules, specifically Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities. Under state regulations, an owner/operator shall perform closure in accordance to 40 CFR Part 265 Subpart G as well as several requirements specific to Missouri regulations.

EPA has also mandated through the Compliance Order that the Brule incinerator unit be closed under interim status general closure standards and incinerator specific closure standards. At

closure, the owner/operator must remove all hazardous waste and hazardous waste residues (including, but not limited to, ash) from the incinerator. Closure requirements of an incinerator unit are similar to clean closure requirements for a storage area.

3.6 Maximum Inventory

On the basis of purchase orders and process knowledge, the West Quincy facility generates about 12,000 paint filters in a typical year, which equates to approximately 400 55-gallon containers or roughly 33 containers per month. The portion of the used absorbent material, as overspray paper, is approximately 10 percent of the total used absorbent material wastestream volume. The weight of each full container varies considerably; however, the estimated average weight is about 150 pounds. Currently, less than 100 containers are held in the container storage area at any one time, prior to transportation off-site.

In May 1991, the maximum number of containers being held within the subject closure area (Section 4.1) was 958 containers or approximately 143,000 pounds of used absorbent material and incinerator ash. Of that amount, approximately 10 percent was paint residue (14,300 pounds). Therefore, chromium containing paint residue is estimated to be approximately 50 percent of total paint residue or approximately 7,200 pounds (48 containers). Nearly all the solid waste handled within the subject closure area was composed of used absorbent material. Absorbent material is not hazardous waste when discarded without paint residues.

3.7 Last Day of Use

The last day of use for the Brule incinerator unit was September 25, 1989. The last day of use for the waste paint filters and overspray paper storage unit, as defined herein for closure purposes, was May 24, 1991.

The subject closure area is approximately 10 percent larger than the exact definition of the waste management units to accommodate ancillary waste management operations (peripheral area), such as movement of the containers. The movement and holding of used absorbent materials in containers has occurred intermittently in this peripheral area. For the purpose of this Closure

Plan, the last date of use for the subject closure area is April 7, 1992, the day this plan is submitted to the EPA.

4.0 CLOSURE

4.1 Definition of Subject Closure Area

The carcass of the Brule incinerator remains along the east boundary of the facility property on an approximately 15 square foot concrete pad. The areal definition of "the Brule incinerator unit" is taken as the extent of incinerator's concrete foundation pad (Figure 3).

The area that comprises the former "waste paint filters and overspray filters storage unit" is not visually evident by current site conditions. The maximum extent of storage of used absorbent material containers can be defined as those conditions just prior to the removal off-site of those containers stored on-site after discontinuing the use of the incinerator, that is, in May 1991. The used absorbent material storage area extends from the incinerator southward along the western exterior wall of Building No. 6, about half-way the length of the building, and east to the fenceline.

To encompass ancillary storage operations (peripheral area) and incinerator operations, the area designated as the subject closure area extends about 75 feet north from the incinerator, five feet east from the fence line, two-thirds of the northern edge of Building No. 6 (66 feet south from the Building's northeast corner) and west to the existing containment building (see Figure 3).

4.2 Verification of Clean Closure Conditions

A preliminary assessment of the subject closure area's current condition was conducted in March 1992. The sampling plan, field report, and the laboratory analytical results are contained in Appendices A, B, and C, respectfully.

The preliminary assessment sampling plan for assessing clean closure conditions for the subject closure area is contained in Appendix A. The sampling rationale for nine surficial soil samples was to characterize the point of exposure most likely to have been affected by any hazardous waste constituent remaining within the subject closure area. Shallow surficial sampling of the subject closure area was conducted on March 16, 1992 (Appendix B). Surficial material of the subject closure area consists primarily of crushed gravel, dust, and brick pieces that have been compacted by vehicular traffic to a very dense condition. Therefore, reasonable manual digging effort with pick and spade penetrated six to 17 inches into the ground surface. As the surface material would be the most likely affected material of a spill of the identified waste material, the samples are deemed by ATEC to be conservatively representative of the top two feet of the ground surface.

Three samples were collected along the wall of Building No. 6, where containers of used absorbent material were temporarily held during past storage activities. Two samples were collected closer to the fenceline, where containers were handled during past storage activities and where ancillary waste hauling activities were conducted the extent of container storage enveloped during the expansion of the storage area after discontinuing incinerator operations. Two samples were collected on either side of the incinerator pad in an effort to characterize the effect of waste handling procedures at the incinerator, both of the waste itself and of incinerator residues. One sample was collected west of the incinerator, and one sample was collected north of the incinerator in an effort to characterize ancillary activities such as current container storage activities. One sample collected was as a duplicate sample for quality control purposes.

All samples met the anticipated closure performance standard for the hazardous waste constituent (hexavalent chromium) of concern. In fact, hexavalent chromium was not detected in any of the samples; the detection level of 0.020 mg/kg is 20,000 times less than the RCRA action level of 400 mg/kg (Section 4.4). Therefore, on the basis of initial sampling and analysis of the subject closure area, no additional material is required to be removed from the subject closure area to meet the standard of protection of human health and the environment.

The subject closure area is preliminarily assessed as having achieved clean closure conditions. The hazardous waste constituent managed at the units has been removed from the storage area

to concentrations below applicable action levels. Documentation of clean closure of the subject closure area under interim status requirements can be accomplished by the presentation of the information contained within this plan accompanied by the records available regarding the historical operation of the subject closure area and certification of the closure report.

Additional closure sampling and analysis for constituents other than hexavalent chromium may be required under closure activities if specific waste residues reasonably derived from the used absorbent material wastestream are detected during waste residue identification activities (Section 4.5.1).

4.3 Incinerator Removal

Under interim status, removal of the incinerator structure is not required to close an incineration waste management unit. Incinerator residues associated with the Brule incinerator have been documented as being removed from the unit in May 1991. Nevertheless, the incinerator will be dismantled and removed from the subject closure area in the near future. Dust or ash that may shake out during the dismantling of the incinerator structure will be addressed as a closure contingency.

4.4 Waste-specific, Site-specific Closure Performance Standard

All used absorbent material handled within the subject closure area is presumed to be a RCRA hazardous waste due to toxicity characteristic leaching procedure (TCLP) for chromium (EPA Hazardous Waste No. D007). The selection of this constituent, the presence of which in a sample extract would render the waste as hazardous under RCRA, is based upon the availability of adequate and verified toxicity data. The constituent for which available toxicology data exists that caused the EPA to list chromium as a hazardous waste constituent, is hexavalent chromium. Therefore, hexavalent chromium is the indicator of waste residues for closure of the subject closure area.

The depth of surficial material applicable to the performance standard, as provided by published EPA RCRA corrective action criteria, is two feet. The EPA-recommended action levels for

contaminants in surficial soil is based upon the latest human toxicity information and recommended exposure assumptions including a lifetime adverse health risk factor of one in one million. The performance standard for hexavalent chromium in soil is 400 mg/kg (approximately equivalent to parts per million).

4.5 Clean Closure Activities

Achieving clean closure ultimately requires the issuance of a final report certified by an independent registered professional engineer that the activities identified within this Closure Plan have been completed. As described below, several phases may be required to complete closure activities. Each phase is contingent upon the information collected during the preceding phase. Clean closure is achieved and the closure report written when no waste residues derived from the managed hazardous waste are present at the waste management units at levels above human health or environmental concern.

4.5.1 Waste Residue Identification/Performance Standard

Except for the incinerator ash, essentially the entire volume of the waste managed within the subject closure area consisted of the used absorbent material wastestream. The only waste residues of concern within this wastestream are waste paint residues bound to absorbent material and specifically, paint residue generated from the Sikkens #S15/84 Red Primer. No other waste residue of quantity or concentration which would likely present a threat to the human health or environment is known to be present within the used absorbent material wastestream.

The wastestream has historically been generated from a limited number of paint products similar to the paint products currently used in the facility process operations (see Appendix D). To effect clean closure of the storage and incinerator units, a sample of used absorbent material from each paint booth on-site will be collected from containers being held in storage prior to transport for off-site disposal. Filters and overspray paper will be representatively composited. Used absorbent material from paint booths using the same paint product will be composited to form a single sample. Each sample will be analyzed for priority pollutants (EPA Methods; 8080, 8240, 8270, total cyanide, and RCRA-8 metals), thereby identifying any other potential

waste residues of concern. At least four used absorbent material samples will be collected at the following facility areas; from the Platform Assembly, from the Hoist Assembly, from the Utility Box, and from the Tool Box/Accessory.

Waste residues detected in the above-referenced samples will be evaluated pursuant to RCRA corrective action standards. Waste residues in the current wastestream with concentrations greater than lifetime risk of adverse health effect of 1x10E5, will be selected as indicators of waste residues for closure of the subject closure area. The performance standard for potential waste residues of concern will be that concentration relating to a lifetime risk of adverse human health effect of 1x10E6.

4.5.2 Verification Sampling and Sample Analysis

Subsurface soils within the subject closure area will be sampled in a fashion similar to the recent clean closure assessment, that is, in a representative pattern with a sample scheme targeted toward the "most-likely to be contaminated" areas. Potential waste residues identified within waste residue identification activities with performance standards will be analyzed for in the collected samples.

The method of identifying waste residues will be for organic components; USEPA Contract Laboratory Program "Statement of Work for Organic analysis -- Multi-Media, Multi Concentration", October 1986, and for inorganic components; EPA Method 7000 series, SW-846, "Test Methods for Evaluating Solid Waste", Third Edition, November 1986.

4.5.3 Verification Sample Analytical Results Evaluation

Should the analysis of verification samples indicate that waste residue levels remaining at the subject closure area are below human health and environmental concern, that is, below defined performance standards, the subject closure area would be verified as having achieved clean closure conditions.

Waste residues detected in subsoils within the subject closure area at the time of closure above its performance standard will be removed from the unit by excavation and disposal in accordance with applicable rules and regulation. The presence of waste residue in the environment that affects a removal action (i.e., waste residue concentration above the lifetime risk of adverse human health of 1x10E6) will also necessitate a statistically valid confirmatory sampling scheme. This secondary verification sampling scheme will involve two grid sampling patterns referred to as "dioxin grid sampling procedures", as prepared by EPA Region VII. Should the analysis of secondary verification samples indicate that waste residue levels remaining within the subject closure area are below human health and environmental concern (i.e., below defined performance standards), the subject closure area would be verified as having achieved clean closure conditions.

4.6 Contingencies

If a second removal action becomes warranted at the subject closure area based upon secondary verification sample analysis, a more comprehensive approach would be necessary to fully define the vertical and horizontal extent of waste residue concentrations.

4.6.1 Confirmatory Sampling and Sample Analysis

The secondary verification sampling scheme described above would provide for a statistically significant 95 percent confidence level for the subject closure area as a whole, but does not provide for identification of any "hot spots". Should clean closure conditions not be verified after a removal action, a groundwater quality assessment program would be undertaken and initially focussed upon the subject closure area as a potential source of groundwater contamination. The assessment program would include an evaluation of hydrogeologic conditions present beneath the site through the installation of monitoring wells. The presence (if any), extent, rate of migration, and constituent concentrations in groundwater would be assessed as necessary to meet the performance standard.

4.6.2 In-place Closure

Should the subsoils within the subject closure area be found to be a continuing source of contaminants to groundwater that cannot be alleviated with a reasonable remedial action, an in-place closure and related closure care would be developed and implemented for the subject closure area. In-place closure rules are generally depicted as those closure regulations associated with landfill facilities, typically involving a final impermeable cover and on-going leachate treatment or groundwater restoration. In-place closure sometimes involves long-term groundwater monitoring and financial assurances.

4.7 Final Conditions

The carcass of the inoperative incinerator is an eyesore and will be removed in an expedient fashion. The structure will be recycled as scrap metal, if possible. Incinerator residues (ash) that come loose during burner dismantling will be collected, sampled and disposed of properly.

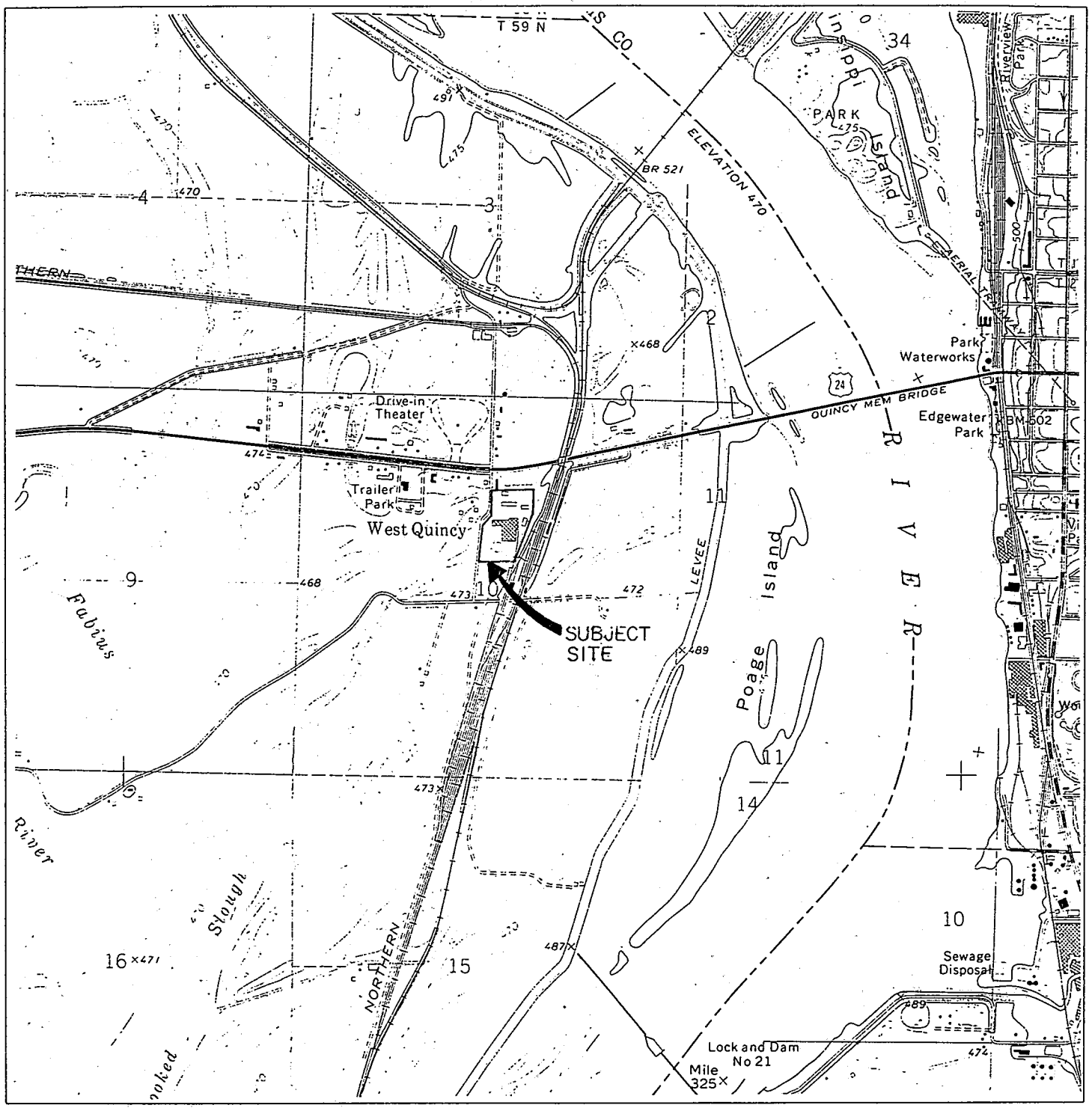
4.8 Closure Costs

Table 1

Item	Unit	Cost
Project Management/Coordination	50 hours	$5,000.00
Waste Residue Identification Container Sampling	Lump Sum 10 hours	$1,500.00 $1,000.00
Waste Residue Analysis	$1,500/sample	$7,500.00
(Verification Sampling) Work Plan Surficial Sampling Sample Analysis Evaluation Report	Lump Sum 10 hours $500/sample	$1,500.00 $1,000.00 $4,500.00
Incinerator Dismantling Structure Salvage/Disposal	Lump Sum Lump Sum/Lump Sum	$3,000.00 $0/$2,000.00
Closure Final Report and Certification		$2,000.00 $3,000.00
Miscellaneous Contingency - 20%	25 hours	$5,000.00
TOTAL		$30,000.00

4.9 Closure Schedule

Table 2						
Activity	Weeks					
	0	5	10	15	20	25
Approved Closure Plan	X					
Work Plan	----------X					
Container Sampling	----------X					
Sample Analysis	----------X					
Verification (if required)		----------X				
Incinerator Dismantling	X					
Closure Report		X		X	X	



QUINCY WEST, ILL.-MO.
NW/4 QUINCY 15' QUADRANGLE

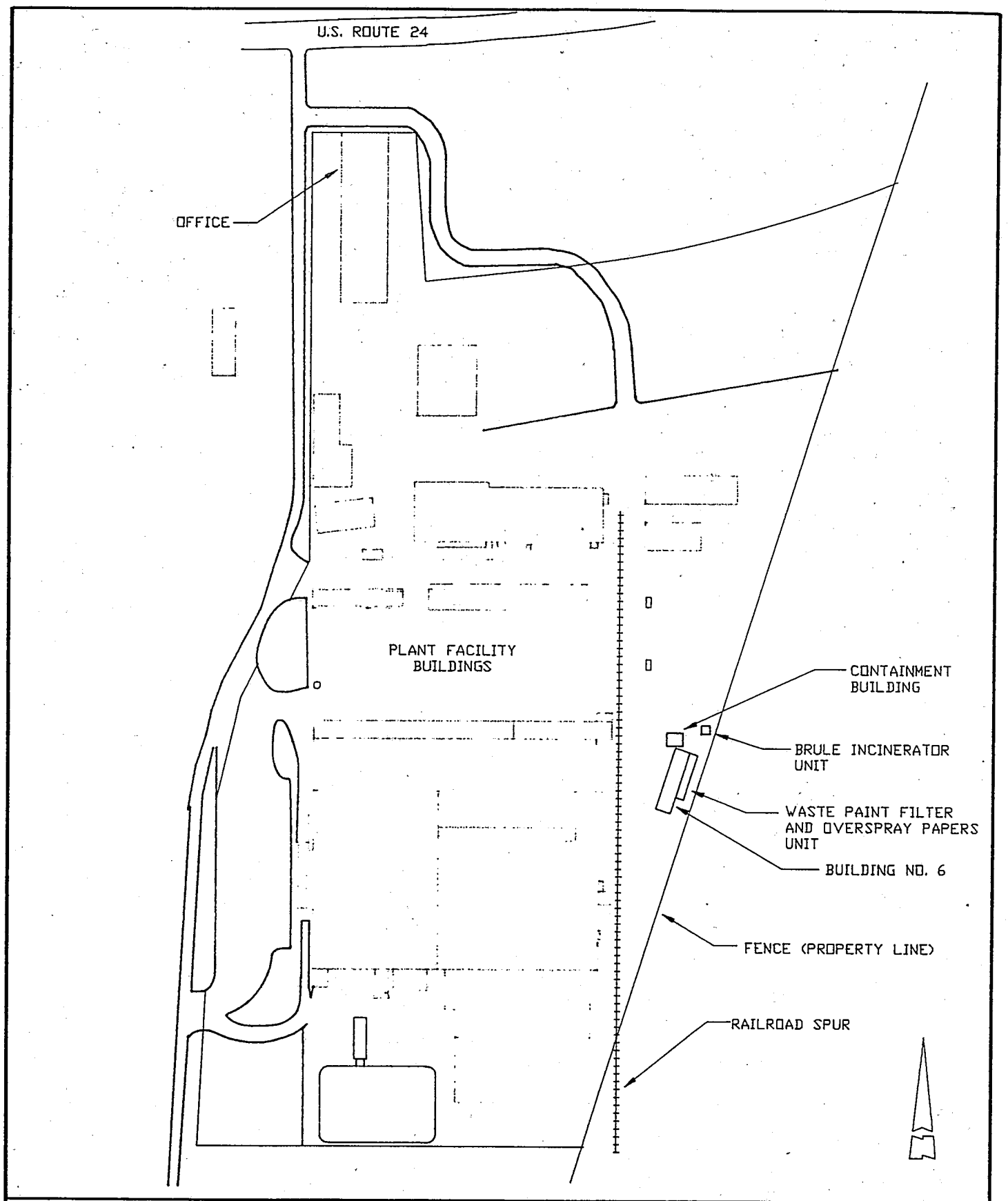
N3952.5-W9122.5/7.5
1971
AMS 2763 IV NW-SERIES V863

QUADRANGLE LOCATION

VICINITY MAP
KNAPHEIDE MANUFACTURING COMPANY
WEST QUINCY, MISSOURI

DRAWN: R. OLSON	PROJECT NO. 92-00050
CHECKED: R.L.J.	SCALE: 1" = 2000'
DATE: 03-26-92	FIGURE NO. 01

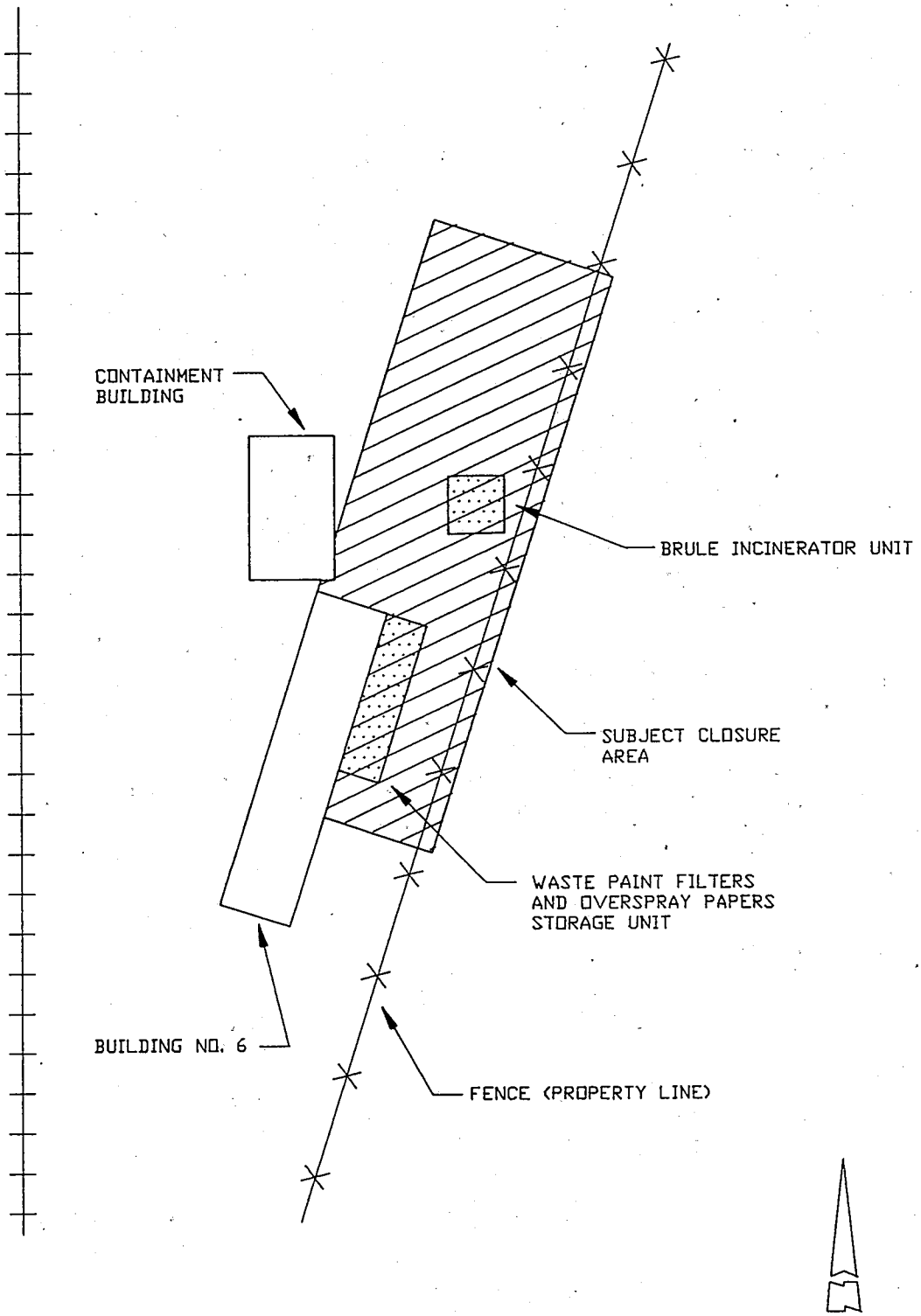
ATEC



SITE PLAN
KNAPHEIDE MANUFACTURING COMPANY
WEST QUINCY, MISSOURI

DRAWN: R. OLSON	PROJECT NO. 92-00050
CHECKED: R.L.J.	APPROX SCALE 1" = 200'
DATE: 04-01-92	FIGURE NO. 02

ATEC



NOTE: WORK THIS FIGURE WITH FIGURE 2

SUBJECT CLOSURE AREA
KNAPHEIDE MANUFACTURING COMPANY
WEST QUINCY, MISSOURI

DRAWN: R. OLSON	PROJECT NO. 92-00050
CHECKED: R.L.J.	APPROX SCALE 1" = 50'
DATE: 04-01-92	FIGURE NO. 03

ATEC

APPENDIX A

SAMPLING AND ANALYSIS PLAN
FOR THE FORMER
WASTE PAINT FILTER AND OVERSPRAY PAPER STORAGE AREA
AND
BRULE INCINERATOR AREA

SAMPLING AND ANALYSIS PLAN
FOR THE FORMER
WASTE PAINT FILTER AND OVERSPRAY PAPER STORAGE AREA
AND
BRULE INCINERATOR AREA

Prepared for:

KNAPHEIDE MANUFACTURING COMPANY

West Quincy, Missouri

Prepared by:

ATEC ENVIRONMENTAL CONSULTANTS

St. Louis, Missouri

March 16, 1992

SAMPLING AND ANALYSIS PLAN
FOR THE FORMER
WASTE PAINT FILTER AND OVERSPRAY PAPER STORAGE AREA
AND
BRULE INCINERATOR AREA

1.0 Introduction -- Waste Characterization

Knapheide Mfg. Co (Knapheide) assembles custom truck body parts at their West Quincy, Missouri facility (see Figure 1). A recent RCRA Compliance Complaint cited Knapheide for storage of hazardous waste over 90 days without a permit. The wastestream in question is used absorbent material which contains absorbed paint residues. A random sample collected in March 1991, of a used filter had detectable concentrations of TCLP chromium in excess of regulatory levels. Currently, the only process paint with chromium as a identified ingredient is Sikkens Red Primer #S15/84 manufactured by Akzo Coatings of America. Red Primer #S15/84 contains less than 5 percent zinc chromate and no other chromium ingredient. The former used absorbent storage area has not been used for storage of waste since may 1991. Knapheide is under contract with Chief Supply, a fuel blending facility, to transport and dispose of containers of used absorbent material.

From 1979 until about 1989, Knapheide burned used absorbent material in an on-site incinerator located adjacent to the storage area. The incinerator was approximately 95 percent effective in reducing the solid volume of burned material.

Knapheide has retained ATEC Environmental Consultants (ATEC) to perform a soil sampling and analysis program at the former used absorbent material storage/incinerator area (subject area) to assess whether the historic handling of the material impacted surrounding soil to a degree above regulatory concern.

2.0 Soil Sampling and Analysis

The subject area is located at the eastern edge of the Knapheide property, between Building No. 6 and the property fenceline (see Figure 2). Historically the containers were limited in extent to along the exterior northern half of the east side of Building No. 6. The incinerator marked the northern extent of the subject storage area.

The storage and incinerator area covers approximately 5,000 square feet. In an effort to assess the subject area, the identified area to be characterized by the sampling was increased by a factor of two. Initially the sampling scheme was formulated according to the statistically valid sampling protocol known as the "Dioxin Grid Sampling Procedures", the results of which would have yielded a 95 percent confidence level (Reference 1). Site conditions on the day of sampling did not avail themselves to many aliquot sample locations; some of the area, especially that around the periphery of the subject area, were covered with manufactured products or other items not associated with the past waste management activity being assessed, and the surface conditions were extremely compacted making manual digging for sample collection difficult.

Therefore, this field modified sampling rationale was developed for nine surficial soil samples to characterize the point of exposure most-likely to have been effected by any waste residues present within the subject area. Three samples were collected along the wall of Building No.6 where containers of used absorbent material were temporarily held during past storage practices. Two samples were collected closer to the fenceline where ancillary storage activities have taken place and where the extent of container storage enveloped during the expanded storage area after the discontinuance of Brule incinerator operations. Two samples were collected on either side of the incinerator pad to characterize the effect of waste handing at the incinerator, both of the waste itself and the resulting incinerator residue. One sample was collected west of the incinerator and one sample was collected north of the incinerator. One sample collected was a duplicate sample for quality control purposes.

Each sample was collected from surficial soil no deeper than could be reasonably dug with a spade. (RCRA Corrective Action standards are established for the upper most two feet of the

ground surface.) Each sample portion was taken so as not to have been in contact with the excavation tools, such as scraping away the exposed face of the hole. Each sample was scooped directly into the sample container with a disposable, sterile wooden scoop. Each sample was collected with dedicated equipment. Sample jars were provided by the laboratory within the laboratory's QA/QC Plan. Sampling documentation will at a minimum include description of soil, observations of staining or discoloration, aliquot depth, sample location and identification number. Sampling activities will be documented by field sketches and photographic means.

The sampling scheme will produce nine discrete samples, a duplicate sample and a field blank. The samples will be analyzed for the hazardous constituent for which the constituent of concern, that is, hexavalent chromium. The analyses will be performed by EPA laboratory methods.

3.0 Evaluation

The sample collection and analysis program was developed in accordance with EPA directives for closure by removal, also known as clean closure (References 2, 3, and 4). Closure by removal facilitates the apparent applicable closure requirements for a RCRA storage and/or incinerator facility (40 CFR Part 265 Subpart G). The maximum RCRA action level for hexavalent chromium in soil, based upon latest human health toxicity information, is 400 parts per million (Reference 5).

4.0 References

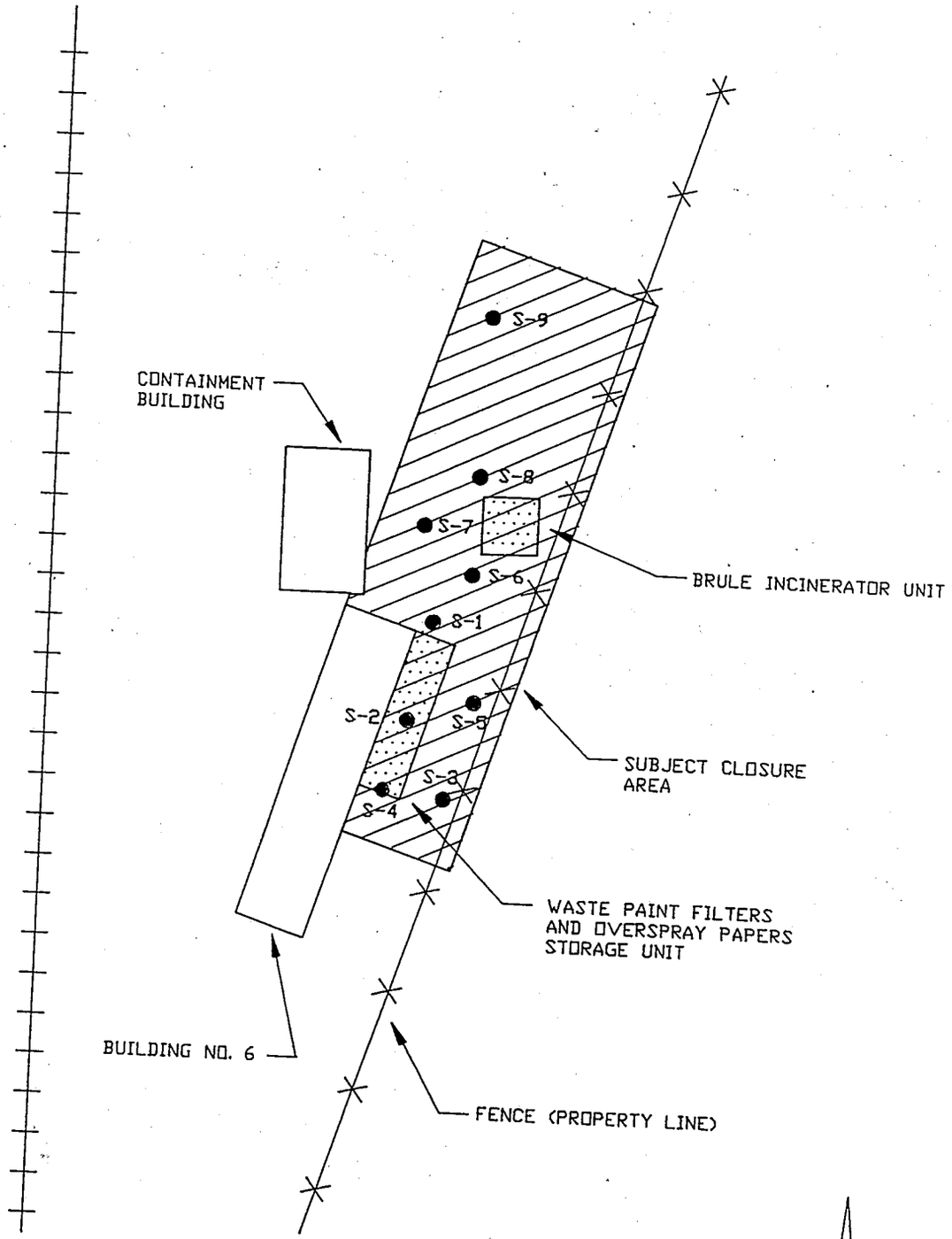
1) "Dioxin Grid Sampling Procedures", U.S. EPA Region VII, undated.

2) "Proposed Amendments for Landfill, Surface Impoundment, and Waste Pile Closure: Proposed Rule", Federal Register, Vol. 52, Pg. 8719. March 19, 1987.

3) "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities; Final Rule", Federal Register, Volume 52, Pg 8704-8709.

4) "Interim status Standards for owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities; Clarification", Federal Register, Vol. 53, Pg. 9944. March 19, 1992.

5) "Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities; Proposed Rule", Federal Register, Vol. 55, Pg. 30798-30884.



LEGEND

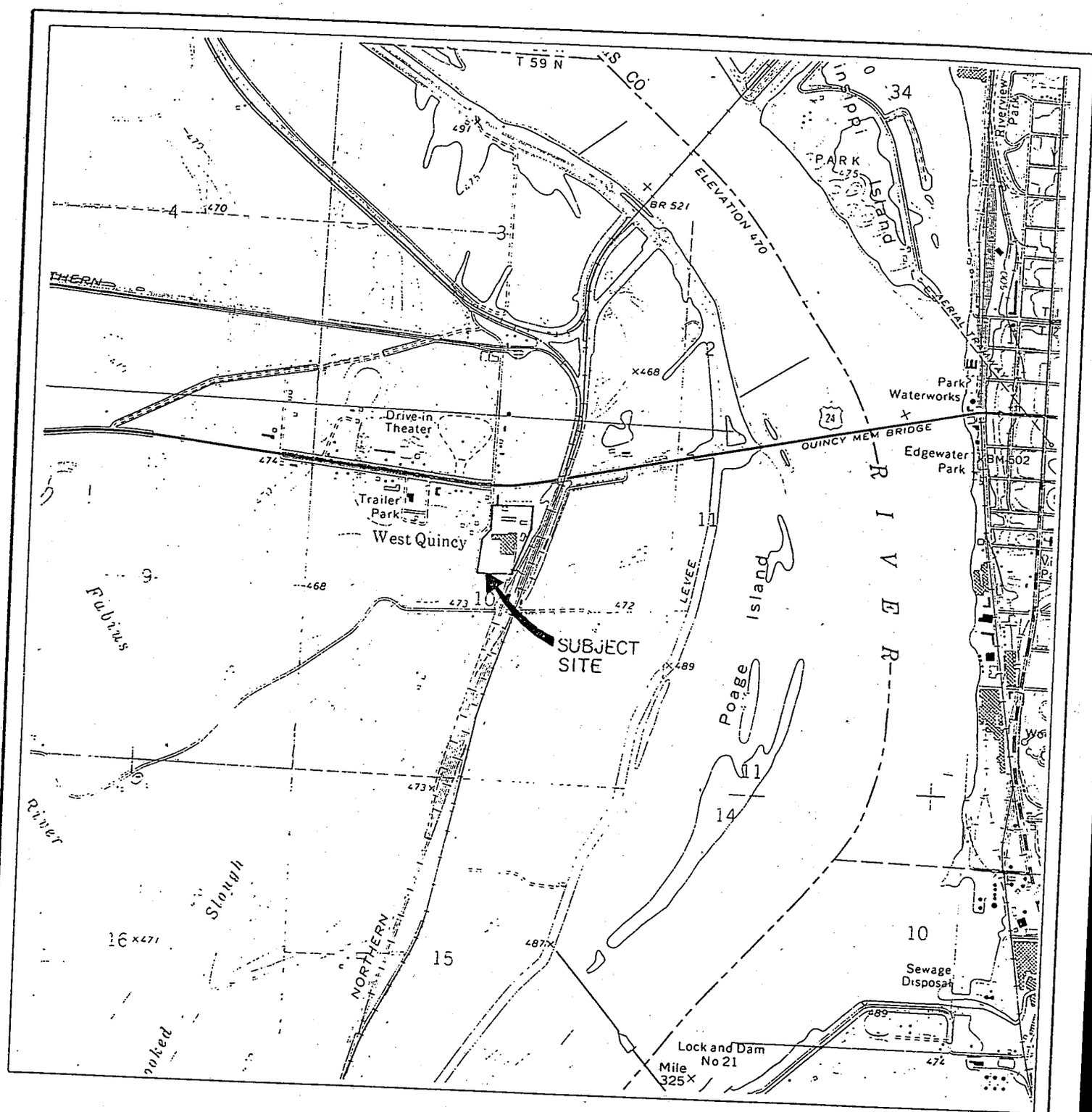
● - SAMPLE LOCATION

NOTE: WORK THIS FIGURE WITH FIGURE 2

SAMPLE LOCATION PLAN
KNAPHEIDE MANUFACTURING COMPANY
WEST QUINCY, MISSOURI

DRAWN: R. OLSON	PROJECT NO. 92-00050
CHECKED: R.L.J.	APPROX SCALE 1' = 50'
DATE: 04-01-92	FIGURE NO. A

ATEC



QUINCY WEST, ILL.-MO.
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N3952.5-W9122.5/7.5
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QUADRANGLE LOCATION

VICINITY MAP
KNAPHEIDE MANUFACTURING COMPANY
WEST QUINCY, MISSOURI

DRAWN: R. OLSON	PROJECT NO. 92-00050
CHECKED: R.L.J.	SCALE: 1" = 2000'
DATE: 03-26-92	FIGURE NO. 01

ATEC

APPENDIX A

GRID SAMPLING GUIDANCE

The Dioxin Grid is utilized by the EPA to confirm the clean up levels at a PCB spill site. The sampling uses a 5,000 square foot area and produces three composite samples from fifty center points. Results from this plan yield a 95% confidence level.

The boarders of the Dioxin grid are traditionally fifty (50) feet by one hundred (100) feet. The center points are situated in straight lines on ten foot centers with the perimeter center points five feet from the boarder (see Figure 1. Dioxin Sampling Grid). Each center point has three sampling points labeled A, B, and C which are two feet from the center point and one hundred and twenty degrees (120°) apart.

Once the grid is set up the sampling crew collects samples from point A on all center points and creates composite A. All the sampling equipment will be either thoroughly cleaned or replaced before the collection of composite samples B and C.

Results from analysis of the samples should be entered in to the equation below to yield a 95% confidence level.

$$CL = \bar{x} + [((t_{0.05,n-1})\ s\ ) / (n^{1/2})]$$

Where

CL = 95% upper confidence level

$\bar{X}$ = Mean

$t_{0.05,n-1}$ = 2.92 (given)

s = Standard deviation

n = Number of samples

Example:

Results received from the laboratory:

Composite A 14 ppm
Composite B 14 ppm
Composite C 48 ppm

The results are placed in the equation and the following table is created:

Composite sample numbers	Mean concentration of each composite sample (ppm) (x_i)	Mean ($\bar{x}$)	Standard deviation (s)	95% upper confidence level (ppm) (CL)
A B C	14.0 14.0 48.0	25.33	19.63	58

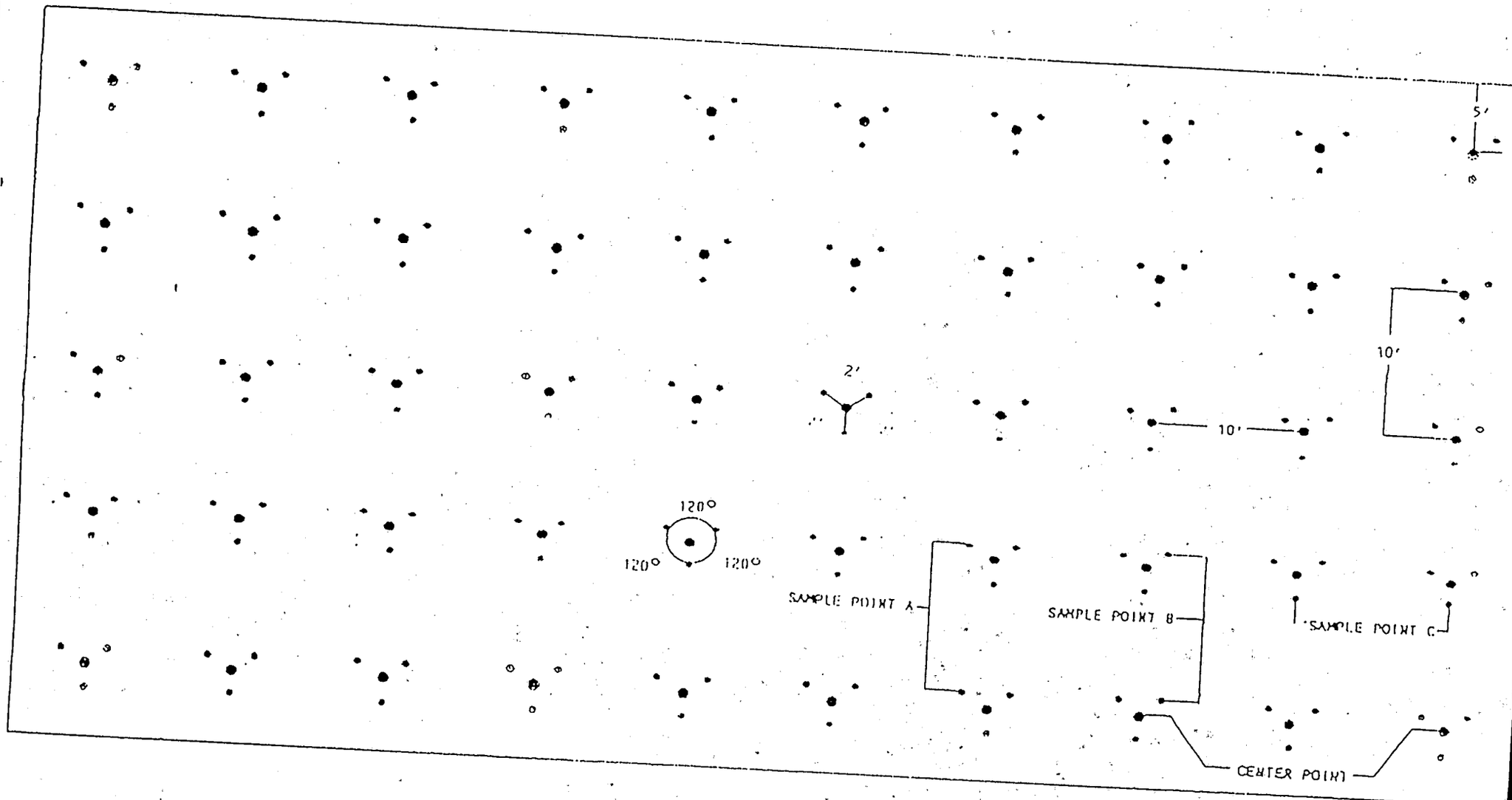


Figure 1. Dioxin Sampling Grid

APPENDIX B

SAMPLING EVENT
SITE SAFETY PLAN

ATEC ASSOCIATES, INC.
SITE SAFETY PLAN

Important: Please forward one copy of completed document to the Director of Health and Safety prior to project start up. Items marked with "1910.120..." are required by 29 CFR 1910.120 in the paragraph noted.

A. GENERAL INFORMATION (1910.120(c)(4))

Project Name: Environmental Protection Agency Region VII Project Number: 53-07-92-00028

Location: West Quincy, Missouri

Client: Knapheide Manufacturing Company

Plan Prepared By: Jami D. Conley

Plan Approved By: R L Johnson Date: 03-13-92

Project Start Date: March 16, 1992 Date: 3/13/92

B. SITE DESCRIPTION (1910.120(c)(4))

Note: On UST Projects this section should include number, size of vessels and amount of remaining material.

Facility History: Facility manufactures truck body parts including paint operations. The facility has operated over several decades.

General Site Description: Plant buildings were constructed as required using several building types. Most of the ground surface is composed of a thin gravel layer or pavement. Most of the facility is secured by a chain-link fence.

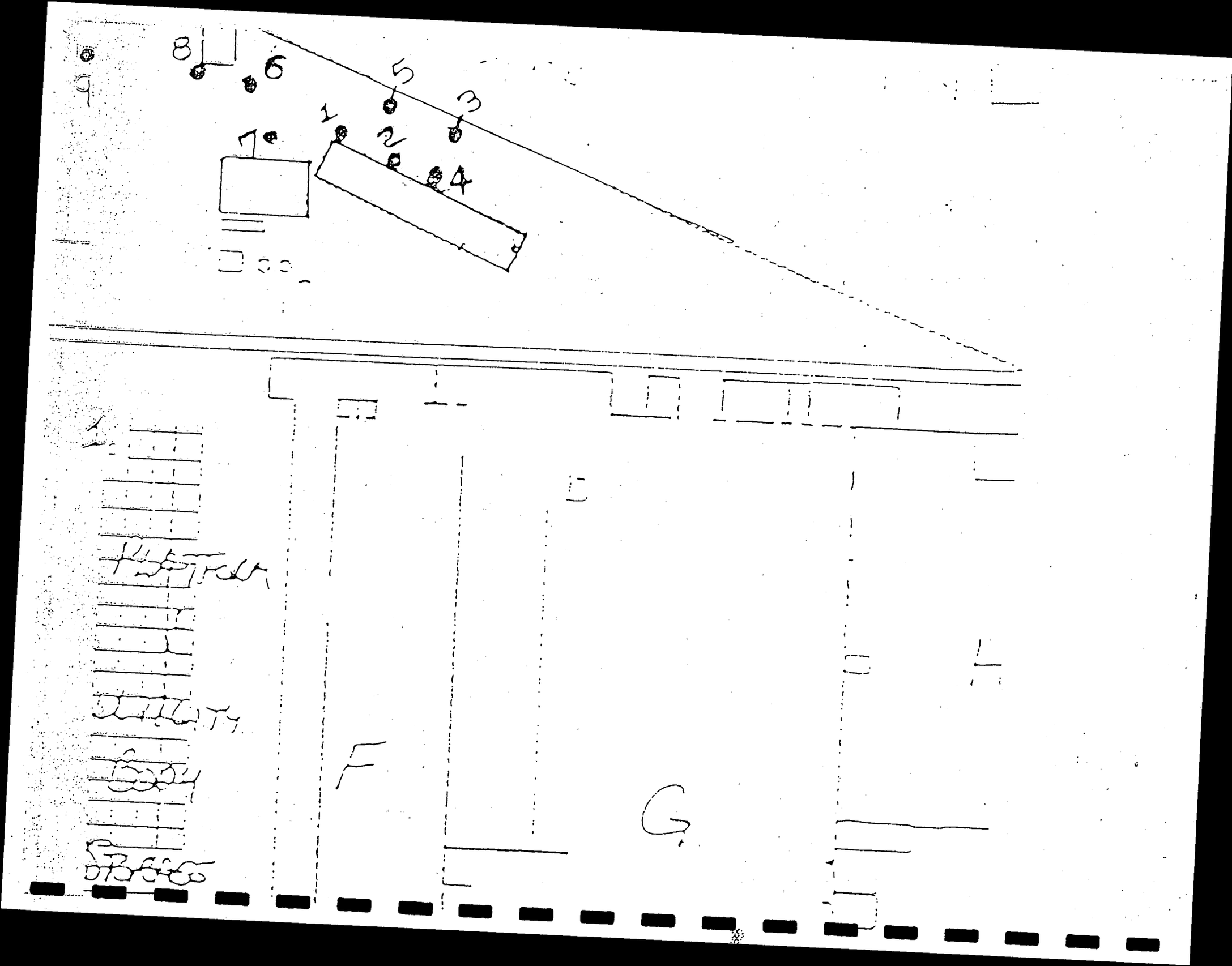
C. PROJECT OBJECTIVE(S) (1910.120(b)(3))

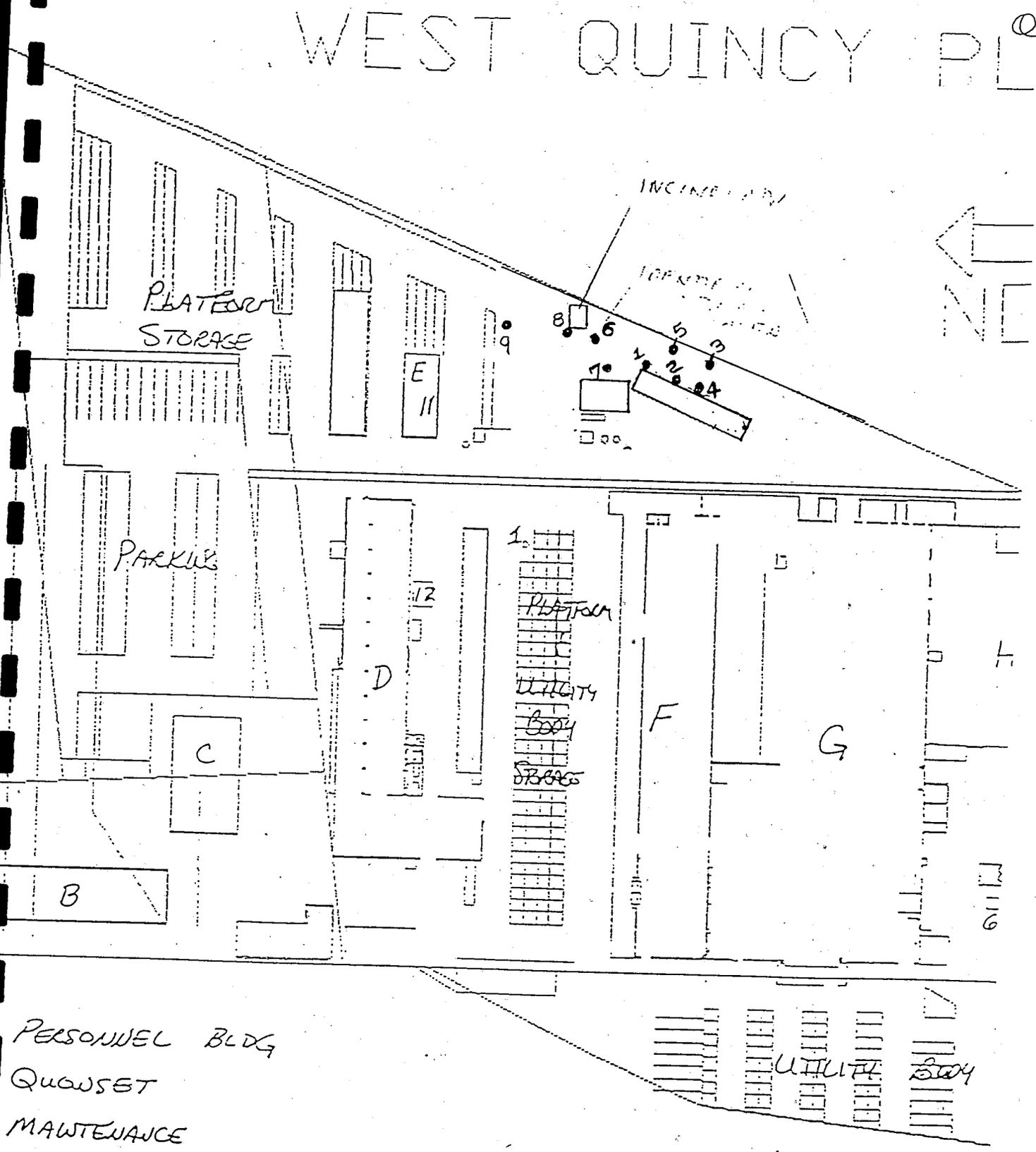
Description of Work Activities Planned: Characterization sampling used of filter and paper area.

D. PROJECT ORGANIZATION (1910.120(b)(2))

Note: Subcontractors employees must also be listed in this section.

Team Member	Responsibility	Type of Safety Training & Date Received
Robert L. Johnson	Senior Project Manager/ Project Safety Office	Health & Safety Training For Hazardous Waste Site Investigation, OSHA 29 CFR Part 1910.120
Dennis P. Firestone	Senior Sample Manager	Health & Safety Training For Hazardous Waste Site Investigation, OSHA 29 CFR Part 1910.120
Bryan N. Gatlin	Sample Technician	Health & Safety Training For Hazardous Waste Site Investigation, OSHA 29 CFR Part 1910.120


8
6
5
3
1
2
7
4
F
G



- PERSONNEL BLDG
- QUONSET
- MAINTENANCE
- PLATFORM ASSY
- WOOD CUTTING & TREATMENT
- FINISHED GOODS WAREHOUSE
- UTILITY BODY & TOOL BOX ASSY
- IN-PROCESS PARTS STORAGE

SEE ATTACHMENT 1 TANK DESCRIPTIONS

BASED ON AN APPROXIMATE 100' SCALE

E. CHEMICAL HAZARD ANALYSIS (1910.120(b)(4))

Contaminant	PEL/TLV	IDLH	LEL/UEL	Flash Point	Routes of Exposure
Chromium VI	0.05 mg/m³	no evidence	not applicable	varies	ingestion

NOTE: Material Safety Data Sheets or CHRIS Data Sheets must be attached for all substances identified above.

F. OTHER HAZARDS

Heat Stress: no If Yes, Specify Precautions:

Cold Stress: yes If Yes, Specify Precautions:
cover exposed surfaces, second change of clothing, high calorie food

Excessive Noise: no If Yes, Specify Precautions:

Confined Space Entry: no If Yes, Attach ATEC Confined Space Entry Permit.

Open Excavations: no If Yes, Is Entry Required?, If yes, Specify Precautions:

Welding/Cutting: no If Yes, Specify Precautions:

Heavy Equipment Operation: yes If Yes, Type of Equipment and Precautions:
high lift and trucks in area

Slip, Trip, Fall Hazards: yes If Yes, Specify type, location and precautions to be taken:
several shallow excavations

Overhead Utilities Present: no If Yes, Specify Location and Precautions to be Taken:

Underground Utilities: no

Utility Location Service:

Name of Contact:

Phone Number:

Precautions to be Taken:

Other hazards: none

G. SITE CONTROL (1910.120(d)) NA

Work Zones have been established as shown on the attached Site Diagram.
Site Security: Security on site will be maintained by:

_____ Temporary Barricades and/or Warning Tape

_____ Security Fence

_____ 24 Hour Security Guard

_____ Other: __

H. PERSONAL PROTECTIVE EQUIPMENT (1910.120(b)(4))

Based on Evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work zones:

WORK ZONE	LEVEL OF PROTECTION	REQUIRED PROTECTIVE EQUIPMENT: (specify exact type, Ex. PVC gloves)	
Exclusion Zone	none	Respirator:	none
		Filters/Cartridges:	~~Tyvek~~ NONE RLJ
		Boots:	yes
		Inner Gloves:	no
		Outer Gloves:	Kleen Guard
		Protective Coverall:	on-site
		Hard Hat:	on-site
		Eye Protection:	on-site
		Other:	

WORK ZONE	LEVEL OF PROTECTION	REQUIRED PROTECTIVE EQUIPMENT	
Contamination Reduction Zone	none	Respirator:	none
		Filters/Cartridges:	none
		Boots:	yes
		Inner Gloves:	no
		Outer Gloves:	Kleen Guard
		Protective Coverall:	Tyvek
		Hard Hat:	on-site
		Eye Protection:	
		Other:	

Exceptions and Modifications:

DECONTAMINATION (1910.120(k))

ersonnel Decontamination Procedures: All personnel entering the exclusion zone shall undergo decontamination prior to leaving the site. ersonnel shall proceed through the following decontamination stations:

Decon Station:	#1	#2	#3
Decon Procedure	remove PPE and place into disposal container		
Decon Equipment:	place in plastic bags for wash decon in office		

Decon Station:	#4	#5	#6
Decon Procedure:			
Decon Equipment:			

uipment Decontamination:

ross Removal By: scrapping in sampling area

econ Solution: soap and water if office sink

econtamination Rinsate:

Collection Method: wash basin

isposal Method, Firm: to POTW via sanitary sewer

AMBIENT AIR MONITORING (1910.120(b)(4)) NA

Activity	Instruments	Action Level	Frequency

Comments: not applicable

K. PERSONNEL AIR MONITORING (1910.120(h))

Activity/Location	Contaminant(s)	NIOSH/OSHA Protocol

L. CONTINGENCY PLAN (1910.120(l))

Emergency Communication Signals: _____

Emergency Escape Routes: To be determined on site, indicate on site diagram.

Emergency Equipment on Site: (Location)

First Aid Kit: ATEC Truck and Knapheide Administration Area

Fire Extinguishers: ATEC Company Truck

Telephone: ATEC Company Truck and Knapheide Administration Area

Eye Wash/Safety Shower: ATEC First Aid Kit/not applicable

Other: _____

Re-entry to the exclusion zone after an on-site emergency shall not be permitted until the following conditions are satisfied:

1) The conditions creating the emergency have been corrected.
2) The hazard(s) have been re-evaluated.
3) The site safety plan has been reviewed and determined adequate for the hazards encountered.
4) All site personnel have been instructed in any new hazards and changes to the site safety plan.

M. OTHER REQUIRED INFORMATION

In order to comply with OSHA standards, the following documents MUST be maintained on site:

1) Hazard Communication Manual (1910.1200)

2) Material Safety Data Sheets for all chemicals brought onto the site, or expected to be encountered (1910.1200)

3) Respirator fit test records for all employees who will be required to wear respirators (1910.134)

4) Copy of ATEC's Respirator Program (1910.134)

5) Latest medical summary for all personnel (1910.120)

N. SIGN-OFF

All personnel, including subcontractor employees, have read the above plan and are familiar with its provisions. By signing below, all personnel are indicating they have received and are current with their medical surveillance and training certification; in accordance with 29CFR (OSHA) 1910.120 and ATEC Health and Safety Policy.

Name	Signature

EMERGENCY PHONE NUMBERS

— Post in Full View —

ATEC Director of Health and Safety (ATEC Office) . . . . . (317) 577-1761

Chemtrec . . . . . (800) 424-9300

Bureau of Explosives . . . . . (202) 293-4048

Communicative Disease Center . . . . . (404) 633-5313
(Biological Agents)

National Response Center . . . . . (800) 424-3802
(Oil/Hazardous Substances)

DOT Office of Hazardous Operations . . . . . (202) 426-0656

Environmental Medicine Resources (ATEC Medical Director) . . . . . (404) 455-0818
–24 hour hotline

Local Emergency Numbers (to be determined at site):

HOSPITAL:

(Name): Blessing Hospital

(Address): Broadway at Eleventh Street

Quincy, Illinois

(Phone): 217/223-5811

Travel Time: seven minutes

Directions: East on Highway 104 over Mississippi Bridge; continue east past stop light to Eleventh Street; left (north) on Eleventh Street; two blocks to Broadway.

Map Attached: _____

PARAMEDICS:

(Name): Quincy Ambulance

(Phone): 911 or 224-6292

FIRE DEPARTMENT:

(Name): Quincy Fire Department

(Phone): 911 or 222-2121

LOCAL POLICE:

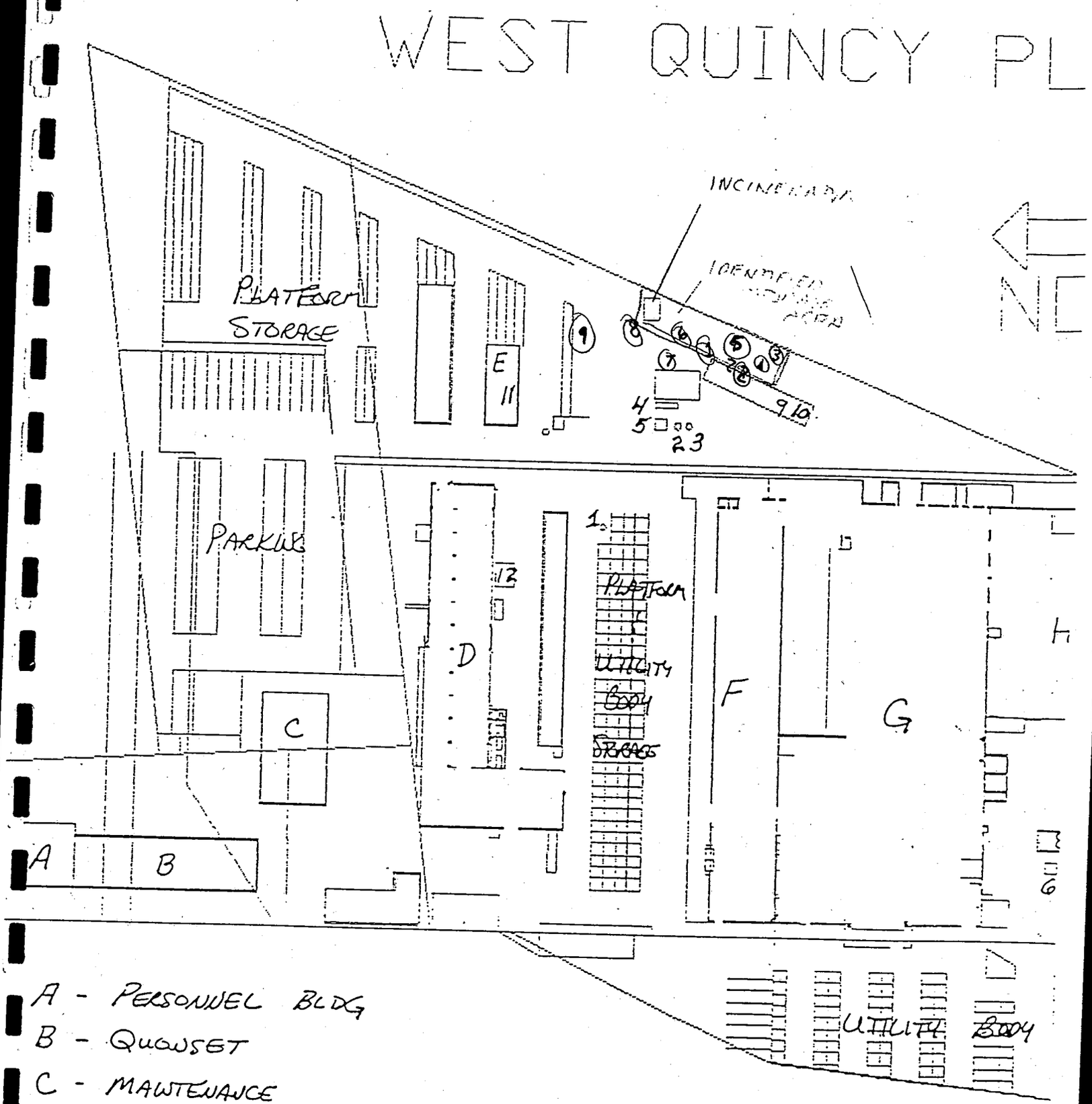
(Name): Quincy Police

(Phone): 911 or 222-9361

UTILITIES:

Electric: Northeast Power and Light, West Quincy 314/769-2113

Gas: CIPS, Quincy 223-1140



A - PERSONNEL BLDG
B - QUONSET
C - MAINTENANCE
D - PLATFORM ASSY
E - WOOD CUTTING & TREATMENT
F - FINISHED GOODS WAREHOUSE
G - UTILITY BODY & TOOL BOX ASSY
H - IN-PROCESS PARTS STORAGE

SEE ATTACHMENT 1
TANK DESCRIPTIONS

APPENDIX B

FIELD SAMPLING REPORT

SITE: Knapheide Manufacturing

DATE: March 16, 1992

ATEC: Robert L. Johnson, Bryan N. Gatlin

I met Robert Johnson, Senior Project Engineer, at the site approximately 10:30 a.m. He informed me that I would be collecting samples from nine discrete locations. He pointed out the nine locations, and stated that the samples were to be collected from the soil immediately beneath the gravel. I was then to ship the samples Federal Express overnight to Global Geochemistry Corp.

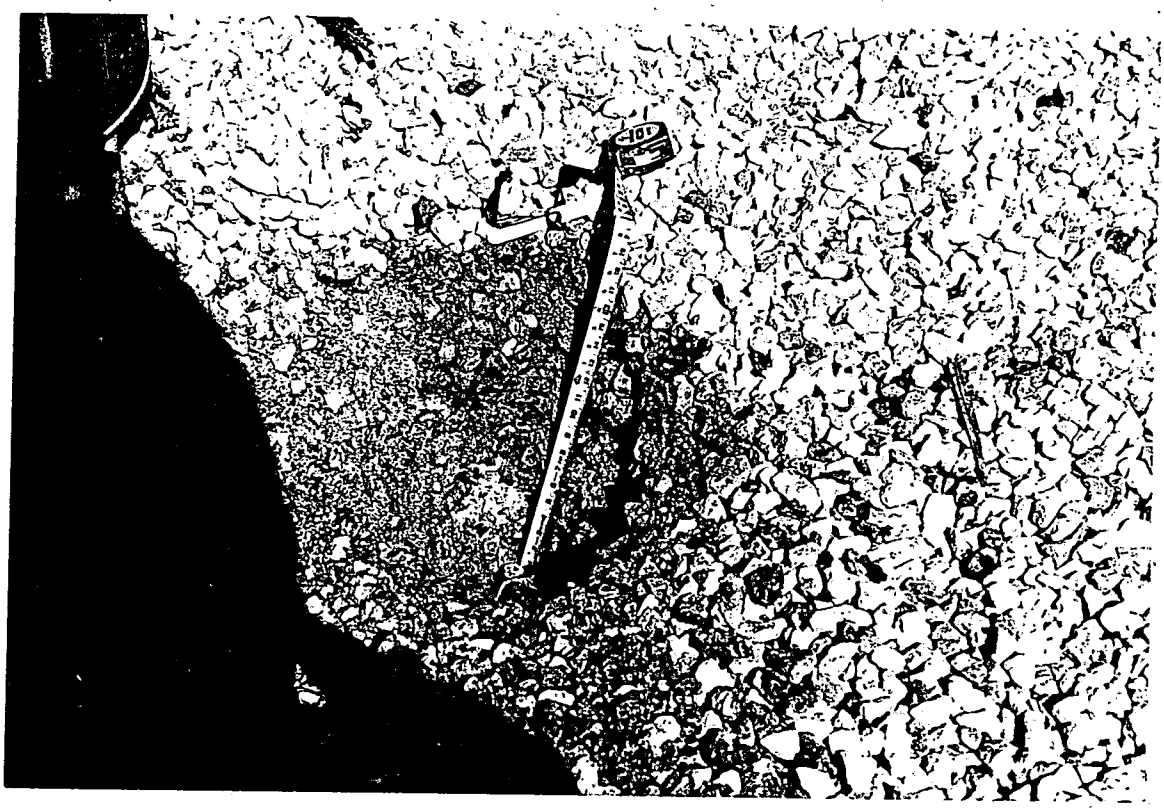
I collected all of the samples with a minimum of difficulty. Soil strata was encountered at the following depths:

S-1) Crushed fines and a brick layer to a depth of four inches below ground surface (bgs);
S-2) Crushed fines and a brick layer to seven inches bgs;
S-3) Crushed fines and a brick layer to seven inches bgs;
S-4) Crushed fines and a brick layer to seven inches bgs;
S-5) Crushed fines and a brick layer to five inches bgs;
S-6) Crushed rock and dark oily layers to nine inches bgs;
S-7) Crushed rock to seventeen inches bgs;
S-8) Crushed rock and dark oily layers to (3-4") to eight and one/half inches bgs; and
S-9) Crushed rock to ten inches bgs.

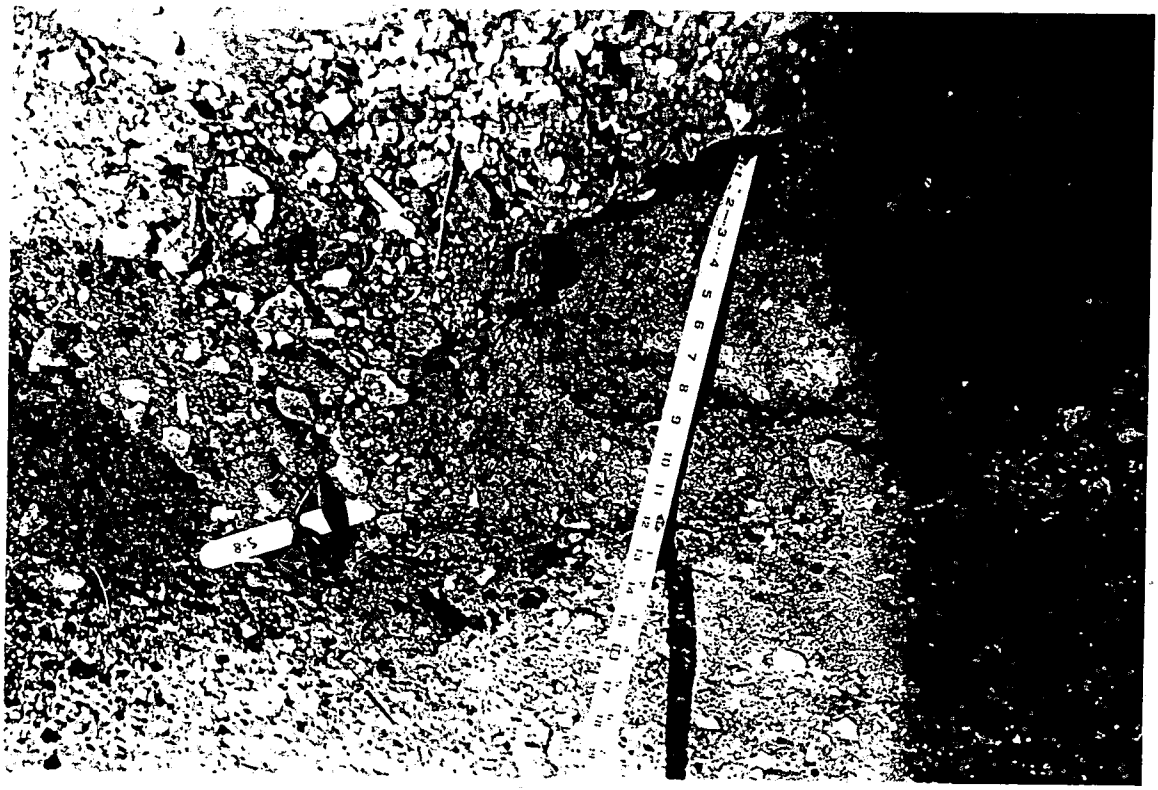
Photographs of the sample locations were obtained. The sample locations were tied in to existing benchmarks, and the holes were filled in. The sample containers were labeled, placed in a chilled cooler, and shipped to the analytical laboratory with appropriate chain-of-custody documentation.

Daily time: 10:30 a.m - 3:00 p.m.

Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-9
Date: 03/16/92
Subject: Sample S-9



Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-8
Date: 03/16/92
Subject: Sample S-7

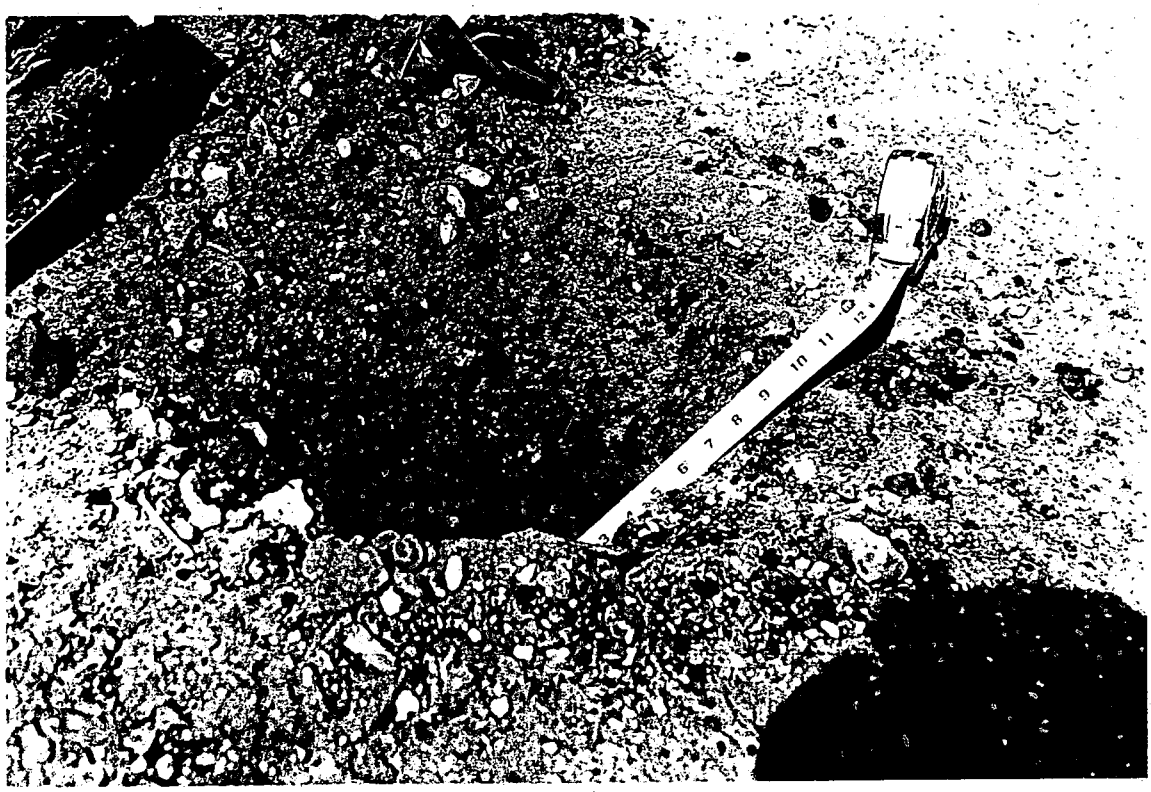


Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-9
Date: 03/16/92
Subject: Sample S-8

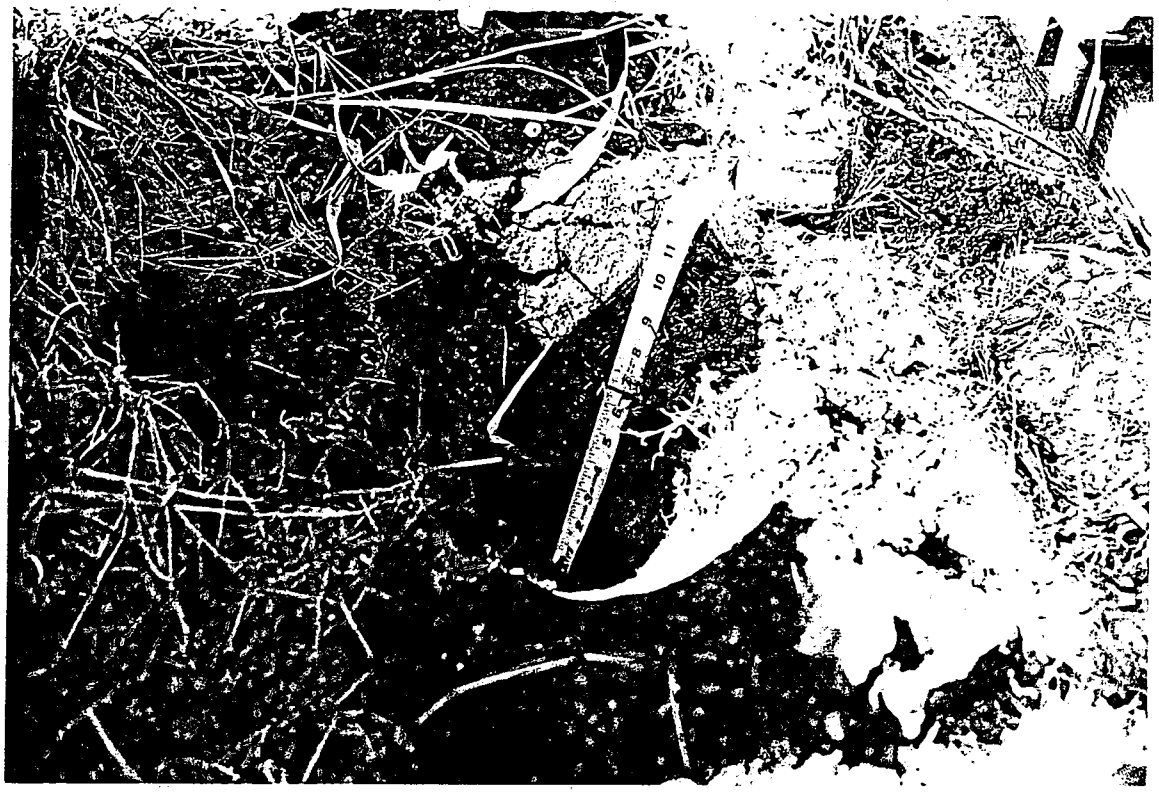
Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-7
Date: 03/16/92
Subject: Sample S-6

Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-8
Date: 03/16/92
Subject: Sample S-7

Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-5
Date: 03/16/92
Subject: Sample S-4



Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-6
Date: 03/16/92
Subject: Sample S-5



Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-3
Date: 03/16/92
Subject: Sample S-2

Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-4
Date: 03/16/92
Subject: Sample S-3

Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-1
Date: 03/16/92
Subject: Sample S-1

Site: Knapheide
Project No.: 92-00042
Photo No.: KMC-2
Date: 03/16/92
Subject: Sample S-2

APPENDIX C

SAMPLE ANALYTICAL RESULTS

Cr VI data for sample submitted by
ATEC Environmental Consultants
Global Geochemistry Corporation 03-18-1992
Data file: 7479IC

Sample	GGCID	Cr6 mg/kg
	1x Det'n Lim	0.020
S-1	7479-1	nd
S-2	7479-2	nd
S-3	7479-3	nd
	7479-3D	nd
S-4	7479-4	nd
S-5	7479-5	nd
S-6	7479-6	nd
S-7	7479-7	nd
S-8	7479-8	nd
S-9	7479-9	nd
	QCCR6	0.267
	%Rec	106.900

SAMPLE MATRIX: SOIL

SAMPLING DATE	: 03/16/92	SAMPLER	: ATEC
EXTRACTION DATE	: 03/17/92	EXTRACTION METHOD	: 218.4
ANALYSIS DATE	: 03/17/92	ANALYSIS METHOD	: 7197

Analyst Supervisor